



## Sixth User Group Meeting

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Los Alamos National Laboratory  
Los Alamos Neutron Science Center  
October 19-21, 2003

### Draft Program

#### Sunday, October 19 – Fuller Lodge

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6:00 - 7:30p Registration and Opening Reception

#### Monday, October 20 – LANSCE, Louis Rosen Auditorium

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7:30 - 8:10a Registration and Coffee

##### Welcoming Remarks

SESSION CHAIR: W. HAMILTON, LANSCE USER GROUP CHAIR

8:15 - 8:25 Welcoming Remarks

**Paul Lisowski, LANL**  
LANSCE Division Leader

8:25 - 8:35 National Nuclear Security Administration  
Welcoming Remarks

**James Van Fleet, DOE/NNSA**  
Director, Office of Defense Science

8:35 - 8:45 University of California Office of the President  
Welcoming Remarks

**Cory Coll, UCOP**  
Director for Laboratory Collaborations

8:45 - 9:05 Science Needs for Homeland Defense

**Sara Scott, LANL**  
Nuclear Nonproliferation  
Division Leader

##### Highlights of LANSCE's History and Capabilities

SESSION CHAIR: S. BAKER, HARVEY MUDD COLLEGE

9:05 - 9:25 History of LAMPF to LANSCE

**John Browne**  
LANSCE Director 1993-1997  
LANL Director 1997-2003

9:25 - 9:35 Historical Perspective by a  
2003 Los Alamos Medal Recipient

**Louis Rosen**  
LAMPF Director 1965-1986

9:35 - 9:50 Charged-Particle Radiography

**Chris Morris**  
LANL/Physics Division

9:50 - 10:10	Recent Accomplishments in Neutron Nuclear Science	<b>Stephen Wender</b> Weapons Neutron Research Facility Leader
10:10 - 10:30	Materials Research for Defense, Basic, and and Applied Science Applications	<b>Alan Hurd</b> Lujan Center Leader
10:30 - 10:45	Break (FRONT LAWN OR ROSEN LOBBY)	

## Selected Highlights from the 2002 Run Cycle and Future Opportunities

SESSION CHAIR: A. HAYES-STERBENZ, LOS ALAMOS NATIONAL LABORATORY

10:50 - 11:10	Plutonium Equation of State: Future research opportunities	<b>Angus Lawson</b> LANL/Materials Science and Technology Division
11:10 - 11:30	Investigation of the Structural Evolution of $\beta$ -Phase Erbium Tritide Using Neutron Reflectometry and Small-Angle Neutron Scattering	<b>James Browning</b> Sandia National Laboratories
11:30 - 11:50	Making a Difference for Stewardship with GEANIE	<b>John Becker</b> Lawrence Livermore National Laboratory
11:50 - 12:10	Particle Image Velocimetry (PIV) Experiments	<b>Katherine Prestridge</b> LANL/Dynamic Experimentation Division
12:10 - 1:25	Lunch (FRONT LAWN OR ROSEN LOBBY)	
1:30 - 1:50	<i>In Situ</i> Loading Response of WC-Ni Cemented Carbide Composites	<b>Aaron Krawitz</b> University of Missouri
1:50 - 2:10	Hydrogen Ions in Enzyme Mechanisms: The power of neutron diffraction	<b>Jenny Glusker</b> Fox Chase Cancer Center
2:10 - 2:30	Hydrogen Storage in Hydrates	<b>Wendy Mao</b> University of Chicago
2:30 - 2:50	It's the (Neutron) Economy, Stupid!	<b>Roger Pynn</b> LANL & UC Santa Barbara
2:50 - 3:10	The National High Magnetic Field Laboratory at Los Alamos National Laboratory	<b>Charles Mielke</b> LANL/National High Magnetic Field Laboratory
3:10 - 3:25	Break (FRONT LAWN OR ROSEN LOBBY)	

## LANSCE User Group Business Meeting

SESSION CHAIR: W. HAMILTON, LUG EXECUTIVE COMMITTEE CHAIR

3:30 - 3:40	Los Alamos National Laboratory Welcoming Remarks	<b>G. Peter Nanos</b> Laboratory Director
3:40 - 4:00	2003 LUG Executive Committee Recognition	<b>Paul Lisowski</b> LANSCE Director
4:00 - 4:10	Presentation of the 19th Louis Rosen Prize	<b>Anna Hayes-Sterbenz</b> Rosen Committee Chair
4:10 - 4:30	Rosen Prize Technical Presentation – A Superthermal Ultra-Cold Neutron Source	<b>Chen-Yu Liu</b> Princeton University
4:30 - 5:00	LUG Business Meeting	<b>William Hamilton</b> LUG Chair
5:15 - 6:30	Poster Session, Vendor Exhibit, and Reception	

Visit the vendor booths and be sure to vote for the top student posters. See ballot and instructions in your registration packet. All ballots must be submitted before 3pm on Tuesday at the registration desk. Only student posters marked with a ♦ on the poster listing and the poster panel are eligible. Student poster prizes have been provided by **Alfa Aesar, A Johnson Matthey Company; Blake Industries; High Pressure Equipment Company; Kurt J. Lesker Company; Keithley Instruments, Inc.; Thermo Electron Radiation Measurement & Protection; and Academy Precision Materials.**

## Tuesday, October 21

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8:00 - 8:30a Coffee (PIÑON CONFERENCE ROOM LOBBY, BUILDING 31, SECOND FLOOR)

### Parallel Sessions A – 8:30-10:30

**Bio and Surfactant Membranes (Piñon Conference Room, Building 31, Second Floor)**

**Condensed Matter & Magnetic Materials (Cactus Conference Room, Building 31, Third Floor)**

### Bio and Surfactant Membranes: phase transitions, protein adsorption, etc. (Piñon Room)

SESSION CHAIR: G. SMITH, HFIR CENTER FOR NEUTRON SCATTERING

8:30 - 8:55	Phase-Sensitive Neutron Reflectometry	<b>Ursula Perez-Salas</b> NIST Center for Neutron Research
8:55 - 9:20	Neutron and X-ray Scattering Studies of Cholera Toxin Binding and Penetration of Lipid Monolayers	<b>Tonya Kuhl</b> University of California at Davis
9:20 - 9:45	Structure and Dynamics of 2d Polymeric Networks of Lipopolymers at the Air-Water Interface	<b>Christoph Naumann</b> Indiana University/Purdue University
9:45 - 10:10	Analysis of Myoglobin Adsorption to Cu(II)-IDA and Ni(II)-IDA Functionalized Langmuir Monolayers by Grazing Incidence Neutron and X-ray Techniques	<b>Michael Kent</b> Sandia National Laboratories

10:10 -10:30	Surface Constraints and Membrane Phase Miscibility Gaps	<b>William Hamilton</b> Oak Ridge National Laboratory
10:30 -10:45	Break (PIÑON CONFERENCE ROOM LOBBY, BUILDING 31, SECOND FLOOR)	

### Condensed Matter and Magnetic Materials (Cactus Room)

SESSION CHAIR: M. RODRIGUEZ, SANDIA NATIONAL LABORATORIES

8:30 - 8:50	Coherent Spin States in Quantum Magnets	<b>Michel Kenzelmann</b> NIST Center for Neutron Research
8:50 - 9:10	Neutron Diffraction Studies on Uranium Antiferromagnets in High Magnetic Fields	<b>Heinz Nakotte</b> New Mexico State University
9:10 - 9:30	Design Rules for New Manganite Compounds with Novel Magnetic and Electronic Properties	<b>Omar Chmaissem</b> Northern Illinois University
9:30 - 9:50	<i>In situ</i> High-Temperature Powder Diffraction Studies of Phase Transformations	<b>Andrew Payzant</b> Oak Ridge National Laboratory
9:50 -10:10	Texture Measurements Using HIPPO – Measurements at temperature and stress	<b>Sven Vogel</b> LANL/Lujan Neutron Scattering Center
10:10 -10:30	<i>In situ</i> Observation of Texture Changes During Phase Transformations	<b>Hans-Rudolf Wenk</b> University of California at Berkeley
10:30 -10:45	Break (PIÑON CONFERENCE ROOM LOBBY, BUILDING 31, SECOND FLOOR)	

### Parallel Sessions B

**Protein Crystallography – 10:45-12:45 (Piñon Conference Room, Building 31, Second Floor)**

**Industrial Research – 10:45-12:45 (Cactus Conference Room, Building 31, Third Floor)**

**Proton Radiography – 10:50-12:45 (LEDA Conference Room, Building 365)**

### Protein Crystallography (Piñon Conference Room)

SESSION CHAIR: L. HANSON, OAK RIDGE NATIONAL LABORATORY

10:45 -11:05	Settling Controversies in Enzyme Catalysis Via Macromolecular Neutron Diffraction	<b>Andrew Mesecar</b> University of Illinois at Chicago
11:05 -11:25	Protein Crystal Nucleation and Growth	<b>Connie Schall</b> University of Toledo
11:25 -11:45	Preliminary Neutron Diffraction Studies of Perdeuterated <i>E. coli</i> DHFR	<b>Chris Dealwis</b> University of Tennessee

11:45 -12:05	Protein Crystallography with Spallation Neutrons: The Protein Crystallography Station at LANSCE	<b>Paul Langan</b> LANL/Bioscience Division
12:05 -12:25	Neutrons, Protons, and Proteins	<b>Dean Myles</b> Oak Ridge National Laboratory
12:25 -12:45	Practical Considerations for Neutron Data Collection from Biological Macromolecules	<b>Leif Hanson</b> Oak Ridge National Laboratory
12:45 - 1:45	Lunch (ORANGE BOX AUDITORIUM, BUILDING 6)	

### Industrial Research (Cactus Conference Room)

SESSION CHAIR: M. GERSPACHER, SID RICHARDSON CARBON COMPANY

10:45 -11:05	Internal Stresses and Dislocation Structure Development in a Superalloy Containing a High- Volume Fraction of $\gamma'$ Phase	<b>Bhaskar Majumdar</b> New Mexico Institute of Mining and Technology
11:05 -11:25	<i>In Situ</i> Neutron Diffraction Study of a Commercial Lithium-ion Battery	<b>Mark Rodriguez</b> Sandia National Laboratories
11:25 -11:45	Dispersion and Agglomeration: Real problems in nanotechnology applications	<b>David Londono</b> DuPont CR&D
11:45 -12:05	Characterization of PEGylated Phospholipid: Protein complexes using small-angle neutron scattering	<b>Carol Kirchhoff</b> University of Illinois at Chicago
12:05 -12:25	Characterization of Structured Fluids During Flow	<b>Alan Nakatani</b> Rohm and Haas Company
12:25 -12:45	Neutron Scattering and R&D at Industry	<b>Takeshi Egami</b> Oak Ridge National Laboratory and University of Tennessee
12:45 - 1:45	Lunch (ORANGE BOX AUDITORIUM, BUILDING 6)	

### Proton Radiography (LEDA Conference Room)

SESSION CHAIR: C. MORRIS, LOS ALAMOS NATIONAL LABORATORY

10:50 -11:10	Capabilities of 800-MeV Proton Radiography at LANSCE	<b>Frank Merrill</b> LANL/Physics Division
11:10 -11:35	A Survey of High-Explosive-Induced Damage and Spall in Selected Metals Using Proton Radiography	<b>David Holtkamp</b> LANL/Physics Division
11:35 -11:55	Proton Radiography on High-Explosive Experiments	<b>Eric Ferm</b> LANL/Dynamic Experimentation Division

11:55 - 12:20	Cosmic-Ray Muon Radiography for Homeland Defense	<b>Gary Hogan</b> LANL/Physics Division
12:20 - 12:45	<i>TBD</i>	<b>Paul Rightley</b> LANL/Dynamic Experimentation Division
12:45 - 1:45	Lunch (ORANGE BOX AUDITORIUM, BUILDING 6)	

### Parallel Sessions C – 1:45-3:25

**Neutron Scattering Instrumentation (Piñon Conference Room, Building 31, Second Floor)**  
**Astrophysics (Cactus Conference Room, Building 31, Third Floor)**

#### Neutron Scattering Instrumentation (Piñon Conference Room)

SESSION CHAIR: A. HURD, LUJAN CENTER

1:45 - 2:25	The IN500 Approach to Neutron Scattering at Pulsed Sources	<b>Ferenc Mezei</b> LANL & Hahn-Meitner-Institut
2:25 - 2:45	LAPTRON: A Dedicated Beamline at Flight Path 8 for High-Pressure Research	<b>Yusheng Zhao</b> LANL/Lujan Neutron Scattering Center
2:45 - 3:05	Upgrading the High-Intensity Powder Diffractometer at LANSCE	<b>Takeshi Egami</b> Oak Ridge National Laboratory and University of Tennessee
3:05 - 3:25	Frontiers of High-Pressure Research: New opportunities in neutron scattering	<b>Ho-kwang (David) Mao</b> Carnegie Institution of Washington
3:25 - 3:40	Break (PIÑON CONFERENCE ROOM LOBBY, BUILDING 31, SECOND FLOOR)	

#### Astrophysics (Cactus Conference Room)

SESSION CHAIR: T. BOWLES, LOS ALAMOS NATIONAL LABORATORY

1:45 - 2:25	Probing Red Giants with Spallation Neutron Sources	<b>Franz Käppeler</b> Forschungszentrum Karlsruhe
2:25 - 2:45	(n,?) Experiments at DANCE and Their Implications to Nuclear Astrophysics	<b>Rene Reifarth</b> LANL/Weapons Neutron Research Facility
2:45 - 3:05	Using (n,a) Measurements to Improve Reaction Rates for Explosive Nucleosynthesis Studies and to Test and Improve the Nuclear Statistical Model	<b>Paul Koehler</b> Oak Ridge National Laboratory

3:05 - 3:25	Nuclear Cross Sections for Planetology	<b>Janet Sisterson</b> Massachusetts General Hospital
3:25 - 3:40	Break (PIÑON CONFERENCE ROOM LOBBY, BUILDING 31, SECOND FLOOR)	

### **Parallel Sessions D – 3:40-5:20**

**Workshop on Nanotechnology (Piñon Conference Room, Building 31, Second Floor)**  
**Neutron Nuclear Science and Instrumentation (Cactus Conference Room, Building 31, Third Floor)**

### **Workshop on Nanotechnology (Piñon Conference Room)**

SESSION CHAIR: S. BAKER, HARVEY MUDD COLLEGE

3:40 - 4:00	Center for Integrated Nanotechnologies	<b>Don Parkin/Terry Michalske</b> LANL/SNL Center for Integrated Nanotechnologies
4:00 - 4:20	Lipid Microarrays: An enabling platform for studying membrane-mediated biological processes	<b>Atul Parikh</b> University of California at Davis
4:20 - 4:40	Integrated Biomolecular Systems: Interfacial issues	<b>Bruce Bunker</b> Sandia National Laboratories
4:40 - 5:00	Introduction to Nanomaterials	<b>Seamus Curran</b> New Mexico State University
5:00 - 5:20	Development of a Flexible Platform for Rapid, Automated Immunological and Nucleic-Acid-Based Detection of Biological Threat Agents	<b>Snezna Rogelj</b> New Mexico Institute of Mining and Technology

### **Neutron Nuclear Science and Instrumentation (Cactus Conference Room)**

SESSION CHAIR: B. HAIGHT, LOS ALAMOS NEUTRON SCIENCE CENTER

3:40 - 4:05	The UCNA Project: A measurement of the beta-asymmetry of the neutron using ultracold neutrons	<b>Albert Young</b> North Carolina State University
4:05 - 4:30	The npd? Polarized Neutron Beamline	<b>Kevin Coulter</b> University of Michigan
4:30 - 4:55	DANCE: An Update on Performance and Experiments	<b>John Ullmann</b> LANL/Los Alamos Neutron Science Center
4:55 - 5:20	Development of a Lead Slowing-Down Spectrometer	<b>Dimitri Rochman</b> LANL/Weapons Neutron Research Facility

## User Meeting Reception and Banquet, Inn at Loretto, Santa Fe

6:30 - 7:15	Reception (ZUNI ROOM)	
7:15	Dinner (TESUQUE ROOM)	
~8:15	Banquet Program	
	Acknowledgements (10 minutes)	<b>A. Archuleta/W. Hamilton</b> User Program Coordinator/ LANSCE User Group Chair
	Presentation of Student Poster Prizes (10 minutes)	<b>K. Corzine Kelley</b> LUG Student Representative
	Keynote Address (30 minutes)	
	<i>The Search for Universality and a Quantitative Predictive Biology from Molecules and Cells to Whales and Ecosystems</i>	<b>Geoffrey B. West</b> Santa Fe Institute and Los Alamos National Laboratory

The LANSCE User Group gratefully acknowledges the sponsorship of tonight's banquet dinner beverages thanks to generous donations by Alfa Aesar, A Johnson Matthey Company; Blake Industries; High Pressure Equipment Company; Kurt J. Lesker Company; Thermo Electron Radiation Measurement & Protection; and Keithley Instruments, Inc.